

1 1. A method comprising:
2 forming an extreme ultraviolet lithography blank
3 having a multilayer stack;
4 forming a non-ruthenium spacer layer over said
5 multilayer stack; and
6 forming a ruthenium capping layer over said
7 spacer layer.

1 2. The method of claim 1 wherein forming a non-
2 ruthenium spacer layer over said multilayer stack includes
3 forming a silicon spacer layer.

1 3. The method of claim 1 including providing a
2 spacer layer having a thickness of at least about 2.4
3 nanometers.

1 4. The method of claim 1 including forming an
2 interface layer between said non-ruthenium spacer layer and
3 said ruthenium capping layer to prevent diffusion between
4 said non-ruthenium spacer layer and said ruthenium capping
5 layer.

1 5. The method of claim 4 including forming said
2 interface layer at a thickness of about 5 Angstroms.

1 6. The method of claim 5 including forming said
2 interface layer of molybdenum or boron carbide.

1 7. The method of claim 1 including forming said
2 spacer layer between about 1 and about 4.5 nanometers in
3 thickness.

1 8. The method of claim 1 including forming the
2 ruthenium capping layer of a thickness greater than 2
3 nanometers.

1 9. The method of claim 1 including forming said
2 capping layer of a thickness greater than 3 nanometers.

1 10. The method of claim 1 including forming said
2 capping layer of approximately 3.8 nanometers.

1 11. An extreme ultraviolet lithography mask
2 comprising:
3 a multilayer stack;
4 a non-ruthenium spacer layer over said multilayer
5 stack; and
6 a ruthenium capping layer over said spacer layer.

1 12. The mask of claim 11 wherein said spacer layer is
2 formed of silicon.

1 13. The mask of claim 11 wherein said spacer layer
2 has a thickness of at least about 2.4 nanometers.

1 14. The mask of claim 11 including an interface layer
2 between said non-ruthenium spacer layer and said ruthenium
3 capping layer to prevent diffusion between said non-
4 ruthenium spacer layer and said ruthenium capping layer.

1 15. The mask of claim 14 wherein said interface layer
2 has a thickness of about 5 Angstroms.

1 16. The mask of claim 15 wherein said interface layer
2 is formed of molybdenum or boron carbide.

1 17. The mask of claim 11 wherein said spacer layer is
2 between about 2.4 and about 3.8 nanometers in thickness.

1 18. The mask of claim 11 wherein said ruthenium
2 capping layer has a thickness greater than 2 nanometers.

1 19. The mask of claim 11 wherein said capping layer
2 has a thickness greater than 3 nanometers.

1 20. The mask of claim 11 wherein said capping layer
2 has a thickness of approximately 3.8 nanometers.

1 21. An extreme ultraviolet lithograph mask
2 comprising:
3 a multilayer stack;
4 a silicon spacer layer over said multilayer
5 stack; and
6 a ruthenium capping layer over said spacer layer,
7 said capping layer having a thickness greater than 2
8 nanometers.

1 22. The mask of claim 21 wherein said spacer layer
2 has a thickness of at least about 2.4 nanometers.

1 23. The mask of claim 21 including an interface layer
2 between said spacer layer and said ruthenium capping layer
3 to prevent diffusion between said spacer layer and said
4 ruthenium capping layer.

1 24. The mask of claim 23 wherein said interface layer
2 has a thickness of about 5 Angstroms.

1 25. The mask of claim 24 wherein said interface layer
2 is formed of molybdenum or boron carbide.

1 26. The mask of claim 21 wherein said spacer layer is
2 between about 2.4 and about 3.8 nanometers in thickness.

1 27. The mask of claim 21 wherein said capping layer
2 has a thickness greater than 3 nanometers.

1 28. The mask of claim 21 wherein said capping layer
2 has a thickness of approximately 3.8 nanometers.